

Effectiveness and impact of climate change mitigation measures unclear

September 17 2012

Strict targets for mitigating climate change require effective climate policy and emission reduction measures. In his thesis, Sampo Soimakallio, Senior Scientist at VTT, analyses uncertainties relating to the effects of greenhouse gas reduction methods and policy measures by examining biofuel production and network electricity consumption, as well as the differentiation of emission reduction commitments among nations and groups of nations.

Uncertainties relating to the assessment of effectiveness of emission reduction measures are considerable. In order to manage these, there is an evident need to develop uniform assessment methods for ensuring that the assumed emission reductions are also achieved in practice.

Significant [mitigation](#) of climate change is widely supported globally. Achieving the mitigation targets will require considerable reductions in global [greenhouse gas emissions](#) in the coming years. However, widely differing views, particularly of the large economies such as the EU, the United States, Japan, China, Brazil and India, on the allocation among nations and groups of nations of greenhouse gas emission reduction obligations have meant that no breakthrough has been made in international climate policy. Nevertheless, climate policy is being implemented actively in many countries, particularly in the EU, where binding obligations have been set for, among others, reducing emissions and increasing the use of [renewable energy sources](#), especially biofuels. At the same time, climatic effects are becoming an increasingly important factor with regard to the [acceptability](#) of various products and

services.

The lack of a sufficiently strict and comprehensive agreement on climate increases the risk that emission reductions, for example in the EU, will lead to increasing emissions in countries that have not committed themselves to emission reduction. Taking this carbon leakage into account when assessing the effectiveness of emission reduction measures is challenging, but vitally important. The effectiveness of individual emission reduction measures is highly dependent on solutions directing the markets, such as the implementation of international climate policy.

Soimakallio shows in his study that the emission reductions achieved, for example by increasing the use of biofuels, are considerably uncertain. In biofuel production, direct climatic effects are caused, for example, by soil processes relating to the cultivation and harvesting of raw materials, and by energy, fertilisers and other commodities needed in the overall production chain. Indirect climatic effects arise as a consequence of various market mechanisms, when growing biofuel production, for example, increases competition for raw materials and land, or changes fuel markets. These factors are often little known and difficult to define accurately, and therefore highly susceptible to assumptions.

Uncertainties relating to these factors have often been ignored and their effects consequently underestimated. For example, the EU's sustainability criteria for biofuels give a rather biased and optimistic view of the climatic effects of biofuels. There is, in fact, a significant risk that emissions caused by biofuel production are considerably higher than assumed in the EU criteria, and that the required [emission reductions](#) will not be achieved. Emissions caused by biofuel production are most probably lowest when the production utilises rapidly decaying bio-based wastes whose processing does not require significant energy input.

According to Soimakallio, the uncertainty relating to the effectiveness of

climate change mitigation measures is certainly not an issue related to biofuels alone, although their assessment is often a very difficult task. For example, the assessment of emissions generated by the production of electricity purchased from grid is also very complex. Different assumptions may lead to very different results and conclusions. This makes it difficult to carry out reliable comparisons between different products and assessments. Soimakallio attaches importance to harmonisation of practices used in the assessment of the effectiveness of [climate change](#) mitigation measures, to increasing the transparency of results and assumptions, and to improving the treatment of uncertainties relating to methods, parameters and modelling. Without such development work it is difficult for consumers and decision-makers to obtain reliable information on the actual climatic effects of various measures, which in turn impedes the steering of society in a genuinely more sustainable direction. It is also particularly important to achieve a comprehensive, binding and sufficiently strict agreement on climate in order to prevent carbon leakage arising from market-related factors.

More information: Assessing the uncertainties of climate policies and mitigation measures, Viewpoints on biofuel production, grid electricity consumption and differentiation of emission reduction commitments: <http://www.vtt.fi/inf/pdf/science/2012/S11.pdf>

Provided by VTT Technical Research Centre of Finland

Citation: Effectiveness and impact of climate change mitigation measures unclear (2012, September 17) retrieved 18 April 2024 from <https://phys.org/news/2012-09-effectiveness-impact-climate-mitigation-unclear.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.